QUANG NGAI RURAL DEVELOPMENT PROGRAM (RUDEP) - PHASE 2

Program Environmental Management Manual
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VIETNAM-AUSTRALIA

Prepared for

AusAID

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Acronyms

AEZs	Agro-Ecological Zones
ASAS	Australian Small Assistance Scheme
ATL	Australian Team Leader
AusAID	Australian Agency for International Development
CCG	Commune Contact Group
CPC	Commune People's Committee
DARD	Department of Agricultural and Rural Development
DCG	District Contact Group
DDO	District Development Officer
DOSTE	Department of Science, Technology and Environment
DPI	Department of Planning and Investment
DPC	District People's Committee
EAC	Environmental Action Plan
EIA	Environmental Impact Assessment
EIAC	Environmental Impact Assessment Checklist
EI&MI	Environmental Impact and Management Issues (for RUDEP)
EMGs	Environmental Management Guidelines
EMP	Environmental Management Plan
E&NRM	Environmental & Natural Resource Management
EPA	GOA - Environment Protection Act, 1974
EPBC	Environment Protection and Biodiversity Conservation Act, 1999
EPL	GOVN - Law of Environmental Protection 1993
GOA	Government of Australia
GOVN	Government of Viet Nam
RUDEP	Infrastructure and Environment Officer
IPM	Integrated Pesticide Management
MOSTE	Ministry of Science, Technology and Environment
NGOs	Non-Governmental Organizations
PDA	Participatory Development Adviser
PEMM	Program Environmental Management Manual
PEPP	Program Environmental Planning Process
PMU	Program Management Unit
PPC	Provincial People's Committee
PCPAPS	Problem Census/ Problem Analysis/ Problem Solving
RUDEP	Quang Ngai Rural Development Program
SS	Scoping study (for RUDEP)
VTL	Vietnamese Team Leader

1 Introduction

The objective of the PEMM is to promote awareness of the principles of environmental management and sustainable development within the Quang Ngai Rural Development program (RUDEP)by setting out the way in which Program activities are to be managed.

Its overriding objective therefore is to provide a framework for the management and protection of the environment of Quang Ngai with regard to the activities and subprojects that are implemented under the Program and to assist Program staff, (particularly the Program Management Unit [PMU]) to avoid and mitigate any negative environmental impacts that Program activities and subprojects might otherwise have.

It is designed to be used as guidance for Program activities and subprojects that require changes in land use or construction of infrastructure. In some cases this may mean that activities require approval through GOVN's formal environmental impact assessment (EIA) and approvals process. It will provide a straightforward process by which PMU and Infrastructure & Environment Officer (RUDEP) can assess the environmental impact of activities and subprojects, identify mechanisms to minimise or avoid negative impacts and to develop an environmental management plan (EMP) to implement and monitor these mechanisms.

The PEMM sets out the environmental procedures to be followed when planning and carrying out all Program activities. These ensure compliance with the guiding principles of the Program which are to comply with the Government of Australia's (GOA) environmental obligations. These are principally set out in the following sources:

- The Environment Protection and Biodiversity Conservation Act, (EPBC Act), 1999.
- AusAID publication, 'Australian Aid: Investing in Growth, Stability and Prosperity', 2002.
- AusAID's obligations under its *Ecologically Sustainable Development Policy* and the raft of Government of Viet Nam (GOVN) laws, regulations and decrees that comprise the Environmental Protection Law (EPL).
- Other applicable Vietnamese laws and regulations, and good environmental practice, including good practice relating to Program activities with the potential to result in environmental health issues.

1.1 Structure of the PEMM

The PEMM outlines the way in which all Program activities are to be assessed and carried out. The process contained in the PEMM assists in identifying environmental issues, and includes guidance on how to address them, as well as providing recommendations as to where further action may be required. By following this set process, the Program aims to safeguard against significant environmental harm occurring either directly or indirectly as a result of any Program activities. The structure of the PEMM is as follows:

- **Section 2 Environmental Management –** Provides background on the purpose of environmental management, including an introduction to the principal environmental issues facing the Program.

- **Section 3 The Program Environmental Planning Process (PEPP)**. The PEPP is a 4 phase process for assessing and managing the impacts of all Draft Plans and Program activities. The process includes review of Draft Plans for compliance with the Program Environment Policy; designing the best way to plan and implement approved activities to minimise environmental impact via use of the EIAC, and the EMGs that it references; and appropriate practices to be followed to maintain the suitability of the land for its new purpose once new activities have been established.
- **Section 4 The Program Environment Policy** – This sets out the Environmental Vision, Objectives and Principles of RUDEP. All proposals/Draft Plans requesting Program assistance must be comply with the requirements of the Environment Policy as a minimum requirement;
- **Section 5 Environmental Impact Assessment Checklist (EIAC)** – The EIAC tables provide guidance on the likely impacts of a range of current Program activities at the Planning, Implementation and Operational Phases. Further information/guidance relating to the range of activities are set out in Environmental Management Guidelines (EMGs)
- **Section 6 Environmental Management Guidelines (EMGs)** – Provide additional information relating to the range of activities set out in the EIAC. The EIAC references the relevant EMG to use to manage a given issue.
- **Section 7 Environmental Management Plan (EMP)** - An EMP is a project-specific activity plan designed to minimise the negative impacts associated with a sub-project or activity identified in the EIA process. Normally the EMP will simply reference relevant recommendations made in the EIAC and EMGs and how these apply to the management of any environmental issues associated with the sub-project or activity.
- **Annex 1 Environmental Action Plan (EAP) –** The EAP is a listing of all Program environmental issues as identified during the Preliminary and Second Environmental Audit visits by the Environmental Specialist. The EAP is simply a table listing these issues and their status and is listed as an Annex as will require constant update.

2 Environmental Management

2.1 Background

All developments and related activities, including rural development programs, will have some negative impacts on the environment, and it is not possible to avoid all these impacts. The purpose of reviewing a Draft Plan against the RUDEP Environment Policy and carrying out an EIA in advance of any proposed development is to ensure that any potential negative impacts are identified. Impacts must be identified before they can be managed.

The are many reasons for undertaking environmental management, including the legal requirements for environmental protection in Viet Nam, however the main reason is that it proper management negative impacts can be minimised, mitigated or avoided.

Most infrastructure developments are designed to alter existing social conditions (especially in areas of poverty or poor health), and to have positive environmental impacts. Upgrading of existing commune and district facilities or construction of facilities may have positive social and cultural impacts but may also incur some negative environmental impacts if measures to reduce environmental effects are not incorporated into the designs. Aspects such as better control of drainage, sewage disposal, erosion and sediment control fall into this category. Such positive impacts should also be taken into account during an environmental assessment in the planning stage of a development.

Similarly the main environmental issues associated with Program activities lie beyond the construction based impacts of infrastructure works. Instead they relate to landscape change via new income generation opportunities that infrastructure works allow for, such as a new road making establishment of a new crop viable in a particular area for example.

2.2 Potential Impacts of Program Activities

One of the main aims of the Program is to introduce means by which communes can generate additional income from changing and improving current agricultural practices and introducing or improving infrastructure. In general terms, the biggest long term environmental effects that encouraging these activities is likely to have relate to the following possible scenarios:

- That people are likely to farm larger areas due to increased access to resources, technology, improved infrastructure and markets.
- That those areas they do farm are likely to be more intensively farmed due to improvements in access to resources, technology, infrastructure and markets, which is likely to place a greater emphasis on additional pesticide and fertiliser inputs.

In order to ensure that these potential impacts are mitigated, alternative agricultural practices and crops better suited to the capability of the land and natural environment need to be encouraged to generate greater incomes for less net environmental impact.

This will represent the best outcome from an environmental standpoint, especially if it can be achieved without the requirement for large, potentially damaging fertiliser and pesticide inputs. The reality however is more likely to represent a combination of these scenarios and it will therefore be important to ensure that Program support of all Income Generation and Infrastructure activities uses the process set out in the PEMM.

RUDEP will therefore involve activities that generally incur small-scale and localised impacts. However, it will be important that RUDEP meet some basic criteria in order to minimise impacts. For example:

- RUDEP will generally exclude activities and subprojects that will require relocation of existing housing.
- RUDEP will require clear land use rights (and LUCs) over any land on which any new infrastructure is to be constructed. Uncertainty in land or infrastructure ownership will exclude a commune from participation in the Program.
- Other environmental impacts normally associated with land use change and infrastructure development include:
    - accelerated erosion and sediment mobilisation due to clearing vegetation;
    - damage to vegetation due to extraction of local timber for building purposes;
    - contamination of ground water or stream catchments due to inadequately designed septic tanks or inappropriately located pit toilets, and pollutants from construction sites;
    - development disrupting local drainage flows; and
    - impacts of quarry/materials extraction sites.

Environmental impacts, including those identified above, will be identified for each activity and subproject through the environmental management process i.e. EIAC and EMP. EMGs will be incorporated into activities and works to avoid or minimise these impacts.

These impacts can be identified and managed effectively with appropriate environment management planning. RUDEP has facilitated this planning process by:

- Raising awareness of environmental issues by incorporating environmental management planning processes into RUDEP activities and training of communes.
- Encouraging communes to anticipate and mitigate the adverse effects, and to plan for maximising the opportunities for environmental betterment.
- By developing a straightforward process by which PMU and RUDEP can meet their environmental planning responsibilities, including:
    - Development of a standard RUDEP EIA Checklist for use on sites identified for construction of new or upgrading of existing infrastructure or any marked/significant change or intensification of land use. The RUDEP would carry out a rapid environmental assessment of the subproject by completing this checklist during the project planning phase.
    - Development of generic environmental management guidelines addressing environmental issues highlighted by the EI&MI Scoping Study.
    - Preparation of simple guidelines to prepare the project EMP and incorporation of EMPs into project documentation.

- Delegating RUDEP the responsibility of monitoring the compliance of contractors with, and effectiveness of, environmental requirements.

Awareness of Environmental Sensitivity

Some landscapes or ecosystems are more fragile, or vulnerable to damage than others, and require special or active protection to avoid damage by activities. Such landscape elements are commonly described as being environmentally (ecologically or culturally) sensitive. A few such areas in Viet Nam have been set aside as conservation areas (national parks, biodiversity areas or wildlife management areas) but many other sensitive areas have no such protection. These include:

- Habitats abundant with wildlife, or habitats of endangered species (undisturbed or only slightly disturbed forests, wetlands or swamps, coastal systems including mangroves or other coastal forests, wetlands and swamps, sandy beaches, small low islands, coral reefs, shallow near shore marine areas of coral, sand or seagrasses).
- Volcanic areas, areas of limestone karst.
- Places of great scenic beauty.
- Archaeological sites (whether recorded or not).
- Sites of cultural significance to local people (particularly ethnic minorities).
- Catchments of rivers supplying drinking water, and areas contributing to groundwater or groundwater lens recharge - mainly limestone areas in the mountainous AEZ and sandy surfaces on lowland AEZ.

Environmentally (ecologically or culturally) sensitive areas, including those identified above, will be identified through the environmental management process i.e. EIAC and EMP. EMGs will be incorporated into activities and works to avoid or minimise damage to these environments.

2.3 Description of RUDEP's Environmental Responsibilities

GOVN and AusAID environment policy aims to ensure that its activities are designed to promote sustainable development and environmental protection by mitigating possible adverse impacts on the environment. A number of components of RUDEP have the potential to cause local environmental impacts. For example, intensification of land use (or marked changes in land use practices), the construction of roads and buildings, provision of a water supply and sanitation systems, and extraction/quarrying/harvesting of materials.

Vietnamese Requirements

A large of number of laws and regulations make up GOVN environmental policy. 29L/CTN - Law on Environmental Protection [EPL] (January 1994) provides the basic framework for environmental management and protection in Viet Nam. This is supported by a number of other decrees:

- Decree N^{o}. 175-CP - guidelines for implementation of EPL.
- Circular No. 490-TT-BK - guidelines on preparation and appraisal of environmental impact assessment (EIA).

- Directive N^{o}. 36-CT/TW - environmental protection.
- Decree N^{o}. 26/CP - enforcement and punishment.

All projects must follow the process established under the EPL:

- *Application for investment license* - for No. 1 type projects this includes the submission of documentation that sets out the potential impacts of the project (to be appraised by relevant state agencies), and for No. 2 type projects requires the submission of the registration form and technical and economic feasibility report. On approval, an investment license is issued.
- *Design stage* - No. 1 type projects prepare and submit the EIA report and technical and economic feasibility report.
- *Completion stage* - prior to operation relevant agencies coordinate regarding the issuance of construction licenses, inspections and stipulation of environmental standards, and approvals and certifications by the environmental standards registration board. Once all of these processes have been completed the relevant environmental license is issued.

Australian Requirements

AusAID has a legislative requirement under the *Environmental Protection Biodiversity Conservation Act 1999* (EPA) to ensure that all matters affecting the environment to a significant extent are fully examined and taken into account. 'Significant' in the context of the Act is defined as *an important or notable effect on the environment.* The Act is administered by the Environmental Protection Agency.

Sustainability is at the heart of AusAID's goal of reducing poverty and it requires the integration of economic, environmental and social considerations in the delivery of the development cooperation program.

Thus, the Program must be designed in such a way as to prevent or mitigate possible adverse impacts on the environment. The publication *Environment Assessment Guidelines for Australia's Aid Program* sets out AusAID's mechanism for ensuring that environmental screening and assessment occurs in every project, and these Guidelines have been taken into account in preparation of the PEMM and EMGs, which have also been based on previous AusAID projects for similar development for example Papua New Guinea's Basic Education & Curriculum Materials Program (1999).

Overall Program Responsibilities

Under the Program it is proposed that activities and subprojects are planned and implemented by the PMU with assistance (as required from DPI, DOSTE and other line agencies for example, PDOT for road subprojects and DARD for agriculture projects), and carried out by the Commune People's Committees (CPCs), local contractors under the supervision of the PMU with advice from the RUDEP and DDOs.

Within this context it is the responsibility of the PMU and RUDEP to:

- Carry out environmental assessment as part of the PEPP using the EIAC and EMGs.
- Submit the appropriate documentation for obtaining the necessary approvals, permits, licences and environmental standards registration.

- Produce an EMP referencing appropriate guidance documents such as EMGs designed to minimise negative environmental impacts.
- Monitor the effectiveness of the EMP and RUDEP's compliance with the environmental management framework.

It is the responsibility of the DOSTE to:

- Consider sub-project EMPs, and any recommendations, in determining whether to approve the development, and in setting conditions on the approval to avoid or minimise environmental damage.
- Undertake checks during implementation and enforce any conditions of approval.

The responsibility of DPI in the environmental planning process is to advise PMU/IEO, and DOSTE as requested, in responding to the proposed environmental planning guidelines and PEMM.

3 Program Environmental Planning Process

The Program Environmental Planning Process (PEPP), consists of 4 phases These 4 phases apply to all sites and all types and sizes of activity within the Program. The PEPP involves the following phases are followed:

1. **Review of Draft Plans for compliance with Program Environment Policy**. This phase involves the PMU deciding whether a Draft Plan of activity submitted by a CPC meets RUDEP environmental (& economic/social) objectives as set out in Program Environment Policy. If the Draft Plan is approved it is then implemented by the activity groups and proceeds to the next Planning Phase.
2. **Environmental Impact Assessment (EIA)/'Planning' phase.** The PMU looks at issues associated with the new activity and decides best way to design/plan activity to minimise environmental impact using the EIAC.
3. **'Implementation' Phase**. Once a decision has been made to develop or change the use of a piece of land, appropriate practices need to be followed when establishing the land for its new use. These are outlined in the EIAC and more detail is provided in relevant EMGs. An EMP is prepared outlining means of mitigating any environmental issues associated with the proposed development.
4. **'Operational' Phase.** Once the land is established for its new use, appropriate practices need to be followed to maintain the suitability of the land for its new purpose and safeguard the health of people and the broader environment over time.

Table 1: Program Environmental Planning Process

Phase	Step breakdown	Important considerations
All communes		
1. Draft Plan submitted by commune for consideration by PMU (eg. a parcel of land is designated for change/development)	**(a) PMU review Draft Plan** **(b) Problem Census/ Problem Analysis/ Problem Solving carried out** **(c) PMU decides whether Draft Plan of activity meets RUDEP environmental (& economic/social) objectives as set out in The Program Environment Policy & Environmental Impact and Management Issues Scoping Study, Dec 2001** **(d) Draft Plan if approved is then implemented by the activity groups**	Does it result in the destruction or loss of any valued habitats? If valued habitat is to be impacted upon then, where practical, alternative locations for the activity should be sought. 'Valued habitats' are defined in *Section 2.4, Environmental Scoping Study).*
2. Environmental Impact Assessment - 'Planning' Phase	(a) PMU looks at issues associated with the new activity and decides best way to design/plan activity to minimise environmental impact using EIAC (b) The IEO and DOSTE will highlight major environmental issues using the EIAC. IEO to carry out any action items identified.	Examples: · The route of a road should involve minimum disturbance of valued habitats such as forest. · Health centres, or kindergartens should where possible avoid locations formerly used for storage of chemicals, fuels or pesticides. · Establishment of a new agricultural activity should avoid the most steeply sloping land adjacent to watercourses

Phase	Step breakdown	Important considerations
3. 'Implementation' Phase	(a) Once a decision has been made to develop or change the use of a piece of land, appropriate practices need to be followed when establishing the land for its new use. (b) Using the EIA Checklist the IEO will collate any generic environmental management guidelines that correspond to the issues identified during the EIA process. These guidelines along with an EMP summary sheet will form the RUDEP EMP. (c) Recommendations within the EMP should be put into project documentation and the EMP attached to all requisite documents. The EMP should state the level of monitoring to be carried out, the responsibility for monitoring, and the remedial activities, which will be carried out if there are any failures of, or non adherence to, the EMP.	Examples: · Where possible retain mature trees. When burning off, fires should allow animals to escape. · Mulch, ground cover or contour bunding should be established on steeply sloping land to safeguard against erosion. · Remediation/removal of any contamination present should be undertaken if site being redeveloped to a sensitive end use (eg kindergarten)
4. 'Operational' Phase	(a) Once the land is established for its new use, appropriate practices need to be followed to maintain the fertility of the land and safeguard the health of people and the broader environment over time. (b) IEO to brief relevant personnel (commune participants, contractors etc) on EMGs at initial meetings. IEO to monitor compliance and the effectiveness of environmental protection measures. At subsequent meetings PMU to check and assist IEO in monitoring responsibilities. PMU to report any serious deficiencies to DPI and AusAID.	Examples: **Fertilisers:** Appropriate amounts of fertiliser for the crop being grown should be applied so that it is absorbed by crops. *(Refer Tables 21 & 22, Environmental Scoping Study for appropriate fertiliser application rates).* **Pesticides:** Reduced pesticide use should be encouraged as part of an IPM program of This will prevent insects building up resistance to pesticides and safeguard human and animal health whilst reducing pesticide costs to farmers. *(Refer RUDEP IPM program).*

4 Environmental Policy

The Environmental Policy of the Program is detailed below. The Policy sets out the minimum requirements of the Program.

RUDEP's Environmental Vision

To improve the livelihoods of people in the Quang Ngai District via the provision of assistance that promotes sustainability and that does not result in increased environmental impact.

RUDEP's Environmental Objectives

- To improve the livelihoods of people in the Quang Ngai District via the provision of infrastructure assistance and advice on income generation activities that promote sustainability and do not result in increased environmental impact; and
- To improve the understanding of how important it is to promote sustainable development in the Quang Ngai District, both at a general level and as a result of Program activities to Program staff, counterparts and commune partners alike.

RUDEP's Environmental Principles

To achieve these vision and objectives, the Program has prepared a Program Environmental Management Manual setting out the environmental procedures to be followed when planning and carrying out all Program activities. These ensure compliance with the guiding principles of the Program which are to comply with the following:

- AusAID publication, 'The Environmental Management Guide for Australia's Aid Program', 2003 (outlining steps to be followed in the environmental assessment of Program activities and procedures for managing environmental impacts).
- AusAID publication 'Australian Aid: Investing in Growth, Stability and Prosperity', 2002.
- AusAID obligations under the Environment Protection and Biodiversity Conservation Act, 1999.
- Applicable Vietnamese laws and regulations, and good environmental practice, including good practice relating to Program activities with the potential to result in environmental health issues.

5 Environmental Impact Assessment Checklist

5.1 Introduction

Without proper assessment during the planning phases of a project, it is not possible to take into account the likely environmental consequences of development. EIA requires thinking in advance of any development activity, what the effects on the environment are likely to be, both during the construction phase and in the longer term.

In order to ensure that a proposed development will be sustainable in the long term, it is necessary to carry out EIA procedures as early as possible during the planning phase. Although all developments have some negative environmental impacts, it is usually possible to take steps to minimise these impacts, both in the immediate project area and in the wider area. The steps proposed form the basis of a project EMP.

5.2 Objectives of Environmental Impact Assessment

The aim of the EIA process is to alert the PMU/IEO to consider environmental issues and to keep the negative impacts to an acceptable level, so development under RUDEP is sustainable. This means ensuring there is minimal damage to sensitive environments such as forests, food gardens, rivers, wetlands, karst areas, mangroves, coral reefs, seagrass beds and other coastal and marine areas, to protect landforms and soil cover, and reduce sedimentation of streams, to minimise damage to habitats, to avoid unnecessary damage to archaeological sites and other sites of cultural significance, and to cause minimal social disruption.

There are common principles that guide all EIA policies and methods:

- All beneficiaries (in this case commune and district level), through the wider RUDEP participatory program and IEO, should be involved in the decision-making process;
- The decision-making process should be simple, clear and open, so the reasons for the decision are apparent to all participants; and
- The system should be cost-effective and time-effective. This is achieved by incorporating the EIA process into the preliminary planning phase of activities and subprojects.

5.3 Scope of The EIAC

The EIAC is one of the primary tools in RUDEP's Environmental Planning Process. It has been developed to allow IEO to carry out a rapid local environmental assessment of activities and subprojects, it will draw attention, during the early stages of development planning, to issues or areas where the negative impacts of activties are likely to occur. The information provided by the EIAC will be sufficient for RUDEP, PMU and DOSTE to develop RUDEP *Environmental Management Plan (EMP).*

5.4 Use of The EIAC

The EIAC directs the attention of IEO towards environmental impacts normally associated with infrastructure and development projects of the type likely to be carried out under RUDEP.

The Checklist requires a simple ***'yes'*** or ***'no'*** answer in the ***'Applicable?'*** Column of the table. A ***'no'*** answer indicates that the issue is not applicable and there will be no negative impact arising and therefore no further action is required. A ***'yes'*** answer indicates that an environmentally sensitive site or a negative impact has been identified and that measures to avoid or minimise these impacts must be carried out. A ***'yes'*** answer will direct DPI to an appropriate action (usually by referring the issue back to the IEO and PMU) or a reference to generic EMGs that will explain the steps necessary to avoid or minimise the negative impacts.

The EIA Checklist, EMGs together form the project EMP. The generic EIA Checklist is set out in Table 2 and the EMGs are set out in Section 6.

Table 2 Environmental Impact Assessment Checklist

This Checklist should be used after the Problem Census/Problem Analysis/Problem Solving phase has been conducted. The identified problems from this process are what inform the draft plan that is considered by the PMU. Once accepted by the PMU, the draft plan is then implemented by the activity groups. The acceptance of the draft plan by the PMU involves an assessment of the proposed income generation or infrastructure activity to ensure that it is consistent with the environmental policy and goals of RUDEP as set out in the PEMM and *The Environmental Impact and Management Issues Scoping Study, December 2001.*

Road & Bridge Construction

Activity Affecting Environment	Impacts on the Environment	Applicable? Yes/No	Main Environmental Issue	Recommended Action	EMG References
Planning Phase					
New track, road or bridge or widening of existing track, road or bridge	Clearance of native vegetation and habitat		Loss of biodiversity	Select alignments and site to avoid areas of undisturbed forest vegetation or areas of known environmental value	**3**
	Encroachment on historically or culturally significant sites		Cultural impacts for community	Consult with community to avoid these areas. Select alignments to avoid them.	**1, 2, 3**
	Creation of pathways for disease vectors		Disease spread to humans and animals and plants	Consult with community to safeguard against this if disease is known to be present in a particular area	**2, 6**
New track/road or widening of existing track/road	Disruption of natural course of river		Affects water communities such as fish, plants and birds	Select alignments to avoid these areas, or ensure that culverts are put in place to allow natural flows	**11**
	Isolation of communities of plants, animals and fish		Isolation can cause communities to deteriorate and die out	Select alignments to avoid the most valued natural habitats eg undisturbed forest areas	**11**
	Creation of opportunity for further illegal land clearing activity		Loss of biodiversity	Consult with community to safeguard against this	**2, 3**
Implementation Phase					
Track/road/bridge construction activity	Increased erosion during construction that enters rivers and streams		Soil and other materials can affect plant, fish and bird communities, via smothering and altering river pH	Ensure that sand and cement is covered or contained and cannot escape into rivers	**4, 9**
	Noise and dust during construction period		Nuisance to community	Provide safety protection for workers. Limit days and time of construction	**2, 4, 5, 6**

Activity Affecting Environment	Impacts on the Environment	Applicable? Yes/No	Main Environmental Issue	Recommended Action	EMG References
Bridge construction activity	Temporary disruption of natural flow of river during placement of foundations in or adjacent to river bed/banks		Affects water communities such as fish, plants and birds	Ensure river flow is maintained	**4**
Storage of road, track or bridge building materials	Soil, sand and cement may enter rivers due to rain or wind		Soil and other materials can affect plant, fish and bird communities, via smothering them and altering river pH	Ensure that sand and cement is covered or contained and cannot escape into rivers	**4, 7, 8, 9, 10**
Digging of borrow pits for a track, road or bridge	If borrow pits are located in sensitive areas eg steeply sloping areas or near rivers, erosion can occur with borrow entering river		This can cause impacts upon water quality in rivers, making it dirty and smothering plants and fish	Select suitable borrow pits or ensure that erosion control measures are in place Eg earth contour bunds	**4, 7, 8, 9, 10**
Construction waste generated from track, road, bridge construction	Waste such as cement bags, plastic etc may enter rivers etc. and cause an impact on the environment		They can cause blockages in the river and small amounts of cement etc to enter the river, affecting water quality for humans and fish and birds	Appropriately dispose of wastes	**4**
Use of heavy plant and machinery	Potential for hydrocarbons to reach river		Impacts on water quality making it bad unsafe to drink and impacts upon fish	Appropriate practices to ensure no wash down of plant in rivers and that fuels and oils are adequately contained	**4, 7**
Operational Phase					
Track/road use	Noise and dust pollution		Nuisance to certain households in community	Site track/bridge away from sensitive community facilities eg kindergartens if possible	**2, 3, 4, 5, 6**
Track/road operation	Erosion of soil from roadsides if not revegetated		Soil can wash into local rivers and streams	Maintenance of road and stabilise sides with structures or vegetation	**4, 8**

Agricultural Activities Changing Land Use

Activity affecting environment	Impacts on the environment	Applicable? Yes/No	Main environmental issue	Recommended action	EMG References
Planning Phase					
Clearance of natural forest areas for agricultural use	Destruction of native vegetation and habitat		Loss of biodiversity	Try to avoid areas of undisturbed forest vegetation or areas of known environmental value and suggest alternatives	**1, 2, 3,12**
	Isolation of plant and animal communities either side of cleared areas		Isolation can cause communities to deteriorate and die out	Leave corridors to prevent animals and plants becoming isolated	**1, 2, 3,11,12**
Clearance of natural vegetation in protected area for agricultural use	Destruction of native vegetation and habitat		Against the Vietnam GOV and AusAid laws and guidelines	Consult with Vietnam regulatory authorities to ensure area being cleared is not protected	**3,12**
Clearance of natural forest areas for housing associated with newly cultivated area	Destruction of native vegetation and habitat		Loss of biodiversity	Minimise clearance of primary forest vegetation when constructing buildings	**3,12**
Housing associated with newly cultivated area	Potential for activities associated with housing eg waste and effluent generation to impact upon river and groundwater		Potential impacts on water quality causing impacts on fish communities and potential human health issues	New housing should construct appropriate wells and toilets to safeguard against health and environmental issues	**2, 7**
Introduction of livestock grazing	Cloven hoofed animals can cause accelerated erosion, and change habitat of an area		Reduction in soil fertility and vegetation and fish smothering due to erosion	Selection of appropriate stocking levels on appropriate land units	**7, 8, 11**
	Potential for ingress of faecal matter to water sources		Potential impacts on water quality from human consumption point of view	House animals at least 20m away from wells and preferably not upslope of them	**2, 7**
Implementation Phase					
Clearing of natural vegetation areas	Increased erosion once clearance has occurred that may enter rivers		Soil and other material can smother plants and fish and affect bird communities	Make earth contour bunds on steep slopes and leave cleared vegetation as mulch to reduce erosion and encourage regrowth. Clear during dry season	**4, 8**

Activity affecting environment	Impacts on the environment	Applicable? Yes/No	Main environmental issue	Recommended action	EMG References
Operational Phase					
Establishment of new crop	Increased erosion of soil if chosen crop is not able to bind soil together or provide sufficient cover. (ie not well suited to the land capability)		Soil may enter rivers, smothering plants and fish and affecting birds	Select appropriate crop for the particular land being cleared	**4, 7, 8, 11**
	Requirement for additional/high fertiliser application due to loss of fertility through erosion and other means if poor crop selection made		High fertiliser application can cause algal growth in rivers and death of fish and plants through oxygen depletion ('Eutrophication')		
Potential for introducing disease with animals into an area eg cattle and pigs	Potential for introducing disease into local animal populations		Potential for disease into local populations to have adverse effect on health and livelihoods of people	Ensure introduced animals are vaccinated	**2**
Potential for genetic deterioration of introduced animals if kept within same village	Increased likelihood of disease amongst animals			Inter-village trade of animals to prevent genetic deterioration	**2**
High pesticide/herbicide application	Impacts upon river quality and deaths of non-pest animals eg insects and birds		Loss of biodiversity and destruction of local habitats. Potential human health issue	Provision of advice on suitable application rates in accordance with IPM program.	**7, 8, 11**
Fertiliser application	Incorrect fertiliser application can change soil composition causing acidity and hardness, and high nutrient levels in rivers		Loss of soil fertility causing loss of income, and potential damage to river ecosystems	Provision of advice on suitable application rates.	**7, 8, 11**
Track/road use to new area	Noise and dust pollution		Nuisance to community	Site track away from sensitive community facilities eg kindergartens if possible	**2, 4, 6, 7**

Buildings & Minor Infrastructure

Activity affecting environment	Impacts on the environment	Applicable? Yes/No	Main Environmental issue	Recommended action	EMG References
Planning Phase					
Potential for pesticide, fuel or chemical contamination on site due to previous use	Environmental health issue if site redeveloped to a sensitive end use eg a kindergarten or health centre		Health issue for people and potential impact on birds and fish	Avoid use of site previously used for storing pesticides or chemicals for sensitive use . If no option, refer to EMG 13 for appropriate action	**13**
Clearance of natural forest areas for buildings or electrical infrastructure	Destruction of native vegetation and habitat		Loss of biodiversity	Try to avoid areas of undisturbed forest vegetation or areas of known environmental value and suggest alternatives	**2, 3, 12**
Construction of a new village or satellite community with new housing	Potential for activities associated with housing eg general waste and effluent generation to impact upon river and groundwater		Potential impacts on water quality causing impacts on fish communities and potential human health issues	New housing should construct appropriate wells and toilets to safeguard against health and environmental issues	**2, 3, 12**
Construction of facility for cassava processing	Potential human health issue of processing area not adequately ventilated		Poorly ventilated processing area can lead to serious human health issues due to inhalation of 'linamarin' from cassava	Ensure facilities are adequately ventilated and that cassava is baked and rinsed during processing	**6**
Implementation Phase					
Situation of well downstream and near to source of human or animal effluent eg. buffalo wallow or toilet	Potential for water quality to be impacted upon by elevated E coli and other micro organisms		Principally a human health issue. Potential for sickness amongst people	Try to ensure that wells are located a significant distance away from buffalo wallows if downslope of them, or that buffalo wallows are relocated	**4, 7**
Location of toilet adjacent to watercourse or source of water eg. A pre-existing unlined well				Try to ensure that toilets are not constructed adjacent to pre-existing wells taking groundwater from a similar depth, or install appropriately lines and filtered well	**4, 7**

Activity affecting environment	Impacts on the environment	Applicable? Yes/No	Main Environmental issue	Recommended action	EMG References
Use of asbestos sheeting for roofs in buildings eg. toilets and bathrooms	Although unlikely, the potential exists for asbestos to be damaged and release fibres.		A human health issue. Asbestos fibres can cause serious respiratory ailments if inhaled in a dust form.	Alternative roofing materials should be utilised where practical. Eg Tin	**4**
				Existing asbestos roofs should be painted to extend life and safeguard against fibre release	**4**
Storage of construction materials	Soil, sand and cement may enter rivers due to rain or wind		Soil and other material can affect plant, fish and bird communities by smothering them and altering river pH	Ensure that sand and cement is covered or contained and cannot escape into rivers. Washing of tools should take place over natural ground away from watercourses	**4, 7, 8, 9, 10**
Construction waste generated	Waste such as cement bags, plastic etc and some residues of materials may enter rivers etc. and cause an impact on the environment		They can cause blockages in the river affecting water quality for humans, fish and birds. Can be ingested by animals	Appropriately dispose of wastes	**4, 7**
Transformer construction	Potential over time for leakages of oils from transformers that can cause impacts on water quality, particularly if oils contain Poly chlorinated Biphenyls (PCBs)		Oil in water supply will cause issues for human consumption. PCBs are a carcinogen (cancer causing) and bio-accumulate	Ensure that transformers put in place are bunded ie they are situated on a concrete base with concrete retaining wells to safeguard any spill from reaching the environment	**7, 8**
Operational Phase					
Use of pesticides/herbicides around buildings	Impacts upon rivers and deaths of non-pest animals eg insects and birds		Loss of biodiversity and potential human health issue if children ingest pesticides/herbicides	Control use of pesticides and herbicides. Use in accordance with IPM program advice	**2, 7, 8**
Lead based paints in kindergarten buildings			Potential human health issue if children come into contact with our ingest lead based paint from surfaces	Site track away from sensitive community facilities eg kindergartens if possible	**4**

Irrigation Activities

Activity affecting environment	Impacts on the environment	Applicable? Yes/No	Main environmental issue	Recommended action	EMG References
Planning Phase					
Establishment of new irrigated area	Clearance of native vegetation and habitat		Loss of biodiversity	Select sites that avoid the requirement to clear areas of undisturbed forest vegetation or areas of known environmental value	**2, 3, 11, 12**
	Encroachment on historically or culturally significant sites		Cultural impacts for community	Consult with community to avoid use of these areas	**2, 3**
	Disruption of natural course of river		Affects water communities such as fish, plants and birds	Select alignments to avoid these areas, or ensure that culverts are put in place to allow natural flow rates	**3, 11**
	Isolation of communities of plants, animals and fish		Isolation can cause communities either side of area to deteriorate and die out	Select alignments to avoid the most valued natural habitats eg undisturbed forest areas	**3, 11**
	Reduced flow in river due to water being diverted		Affects water communities such as fish, birds and plants by reducing available habitat and nutrients	Ensure that diversion into irrigated area is not too great so as to disrupt natural river flow	**3, 11**
	Potential for drawdown if groundwater being used as source of irrigation water		Can result in lowering of water table and drying of wells impacting upon peoples health	Ensure that an assessment of the suitability of the source of irrigation water is made prior to implementation	**11**
Implementation Phase					
Construction of new irrigated area	Increased erosion during construction of bunds that may enter rivers and streams		Soil can smother plants and fish and affect bird communities	Ensure that sand, cement and soil is covered or contained and cannot escape into rivers	**4, 7, 8, 9**
	Noise and dust during construction period		Nuisance to community	Provide safety protection for workers. Limit days and time of construction	**4, 5, 6**

Activity affecting environment	Impacts on the environment	Applicable? Yes/No	Main environmental issue	Recommended action	EMG References
Storage of building materials for construction of irrigated area	Soil, sand and cement may enter rivers due to rain or wind		Soil and other material can affect plant, fish and bird communities by smothering them and altering river pH	Ensure that sand and cement is covered or contained and cannot escape into rivers	**4, 7, 8, 9**
Waste generated from construction of irrigated area eg concrete channels etc	Waste such as cement bags, plastic etc may enter rivers and cause an impact on the environment		They can cause blockages in the river and small amounts of cement etc to enter the river, affecting water quality for humans, fish and birds	Appropriately dispose of wastes	**4, 7, 11**
Operational Phase					
The newly established irrigation area will be subject to herbicide and pesticide application	Impacts upon river water quality and deaths of non-pest animals eg insects and birds		Loss of biodiversity and potential human health issue	Control use of pesticides and herbicides	**2, 7, 8**
The newly established irrigation area will be subject to fertiliser application	Impacts upon river water quality through elevated levels of nutrients		High fertiliser application can cause algal growth in rivers and death of fish and plants through oxygen depletion (‘Eutrophication’)	Use appropriate quantities and types of fertilisers, such as natural fertilisers like buffalo manure where practical	**2, 7, 8**
Petrol or diesel pumps in use on irrigation system	Diesel or petrol residues may escape to river		Hydrocarbons such as petrol and diesel can cause fish deaths and affect quality of water for human consumption	Ensure petrol and diesel is appropriately stored away from sensitive receptors such as rivers	**2, 4, 7**
	Noise pollution		Nuisance to certain households in community	Site pump away from houses where possible or restrict hours of use	**2, 5**

6 Environmental Management Guidelines

Summary Sheet

District:	
Commune:	
Village:	
Date:	

USER NOTES: The following Summary Sheet is to be completed by RUDEP Program Management Unit (PMU) and Infrastructure and Environment Officer (IEO) once the various environmental control guidelines required for Program activities and subprojects have been identified. This document and the environmental management guidelines (EMGs) it nominates will become the RUDEP Environmental Management Plan (EMP) and should be attached to the documents submitted for Department of Science, Technology and Environment (DOSTE) approvals and licenses, tender documentation and the final contract documentation. ***Further information can be obtained from the Environmental Impact and Management Issues Scoping Study, URS, December 2001 ('Environmental Scoping Study') and references are made within the EMGs to information contained within this report.***

Tick the EMGs required for this activity or subproject and attach the EMG to the back of the Summary Sheet.

EMG 1 - Cultural Heritage

EMG 2 - Social and Community Concerns

EMG 3 - Protection of Sensitive Areas

EMG 4 - Construction Management

EMG 5 - Noise Control

EMG 6 - Dust Control

EMG 7 - Water Quality

EMG 8 - Soil and Nutrient Management

EMG 9 - Controlling Sediment

EMG 10 - Management of Stockpiles & Spoil heaps

EMG 11 - Water Management

EMG 12 - Vegetation Clearance

EMG 13 Assessment & Management of Contamination

Signed and Dated:

RUDEP Infrastructure and Environment Officer

PEMM Environmental Management Guideline No. EMG 1

CULTURAL HERITAGE

Policy/Objective	To ensure that the works have only acceptable impact on the cultural heritage of the local population.
Control Measures	1. The Contractor will liaise with the local community to identify sites of cultural importance. 2. The Contractor shall ensure that all such areas, trees, structures or sites of cultural importance are protected, if necessary by barriers. 3. The Contractor shall ensure that all construction workers are aware of the significance of such sites. 4. Local community to appoint a watchperson to ensure that such sites are not damaged or violated.
Monitoring	The IEO will liaise with local community to ensure that sites of cultural importance are/have been adequately protected.
Corrective Action	If any damage occurs, discuss with the local community an implement any remedial actions requested by them.

PEMM Environmental Management Guideline No. EMG 2

SOCIAL AND COMMUNITY CONCERNS

Policy/Objective	To minimise social disturbance and maximise community benefits from RUDEP activities and subprojects.
Control Measures	1. The PMU will advise the local community of RUDEP plans in advance of any works, construction or activities, and through RUDEP participatory framework involve them in planning and implementation. 2. The Contractor will liaise with the local community to identify culturally sensitive areas and avoid disturbing them (refer to EMG 1). 3. The Contractor to negotiate access to and use of local resources with the local community and DOSTE. 4. The contractor to negotiate with the local community and DOSTE regarding the location of disposal areas and stockpiles (refer EMG 10). 5. The Contractor to avoid disturbances near residential areas where possible. 6. The Contractor shall control runoff and manage sediments near gardens, fishponds and water bodies (refer EMG 11) 7. The Contractor shall arrange for local people to be employed and trained on aspects of the activity or subproject. 8. Women's Union and other commune groups to be included in subproject activities.
	9. The community should be consulted to establish whether diseases are present in an adjacent area that could be spread by the establishment of a road or planting of a particular crop type 10 The community should be consulted to establish whether establishment of road or bridge infrastructure is likely to give rise to added pressure to degrade local natural resources, such as via logging activity etc
Monitoring	The IEO will liaise with local community to ensure that the local community is fully informed and that any areas of concern are acted upon.
Corrective Action	Any problems or complaints to be recorded and actions taken to resolve concerns undertaken immediately and also recorded.

PEMM Environmental Management Guideline No. EMG 3

PROTECTION OF SENSITIVE AREAS

Policy/Objective	To minimise negative impacts on sensitive ecosystems, culturally sensitive areas and the natural environment. ***(Refer Section 2.4, Environmental Scoping Study)***
Control Measures	1. The PMU will advise the local community of RUDEP plans in advance of any works, construction or activities, and through RUDEP participatory framework involve them in planning and implementation. 2. The Contractor will liaise with the local community to identify culturally sensitive areas and avoid disturbing them **(refer to EMG 1)**. 3. The PMU shall locate all construction sites/activities away from sensitive areas. 4. The PMU shall ensure that the Contractor is aware of locations of sensitive areas and avoids them. 5. The Contractor shall ensure that all construction workers are aware of the significance of such sites and the need to avoid impacts on any such sites. 6. Ensure that Program activities/infrastructure do not result in isolation of communities of plants, animals and fish, or disrupt watercourses. Ensure that culverts etc are in place to allow natural flow lines to be maintained 7.Ensure that Program infrastructure such as roads and bridges do not contribute to increased exploitation of natural resources e.g. by providing improved access for illegal logging activity
Monitoring	The IEO will liaise with communes to ensure that environmentally sensitive sites are protected.
Corrective Action	If any damage occurs, discuss with the communes and DOSTE and implement any remedial actions requested by them.

PEMM Environmental Management Guideline No. EMG 4

CONSTRUCTION MANAGEMENT

Policy/Objective	To minimise inconvenience and to ensure that construction workers, school students, RUDEP staff and local residents are not endangered during the implementation of activities and subprojects and that appropriate construction materials are used and wastes are appropriately disposed of (particularly during construction works).
Control Measures	The Contractor shall ensure that all health and safety requirements are in place on the construction site, and with the IEO shall conduct an awareness campaign for staff and local residents to ensure that all are aware of possible danger. Erect barriers to restrict access to work areas and ensure personnel are appointed to monitor movement around work sites. Control measure shall include: 1. Erection of personnel barriers to limit access to unauthorised personnel 2. Construct and maintain alternative routes around work sites 3. Employ local residents to facilitate awareness and monitor the movement of residents around work sites so they are not endangered in any way 4. Clearly signpost alternate routes and detours 5. Store all materials and equipment on site so as to prevent damage to the site and minimise hazards to persons, materials, equipment and the environment 6. Hazardous goods (including fuel and oil) shall be stored and handled only within an area set aside for that purpose and was down of vehicles should occur in a contained area away from watercourses 7. Ensure that activities do not significantly disrupt the natural flows of rivers during construction 8. Ensure that asbestos containing materials are not used in building construction. Where asbestos roofing materials have been used, these should be painted to safeguard against detrioration and prevent fibre release 9. Ensure all wastes generated are appropriately disposed of in accordance with GOV laws and guidelines. Use Filter/gross sediment traps where applicable: These consist of a mesh or grid near the outlet drain from a quarry or construction site, to trap items of waste such as plastic bags, cans, bottles, paper. Such traps should be cleaned regularly and the waste disposed of appropriately. 10. Ensure that all transformers are underlain by concrete and bunded to contain any leakages of oils that could potentially occur via leakage
Monitoring	IEO to conduct regulare inspections during construction activities, check on safety measures and waste management issues. Contractor and IEO to liaise with local CPU leaders regarding appropriate locations for work sites and alternate routes and detours if required.
Corrective Action	Any problems to be acted upon immediately and recorded by IEO.

PEMM Environmental Management Guideline No. EMG 5

NOISE CONTROL

Policy/Objective	To minimise the impact of noise on residents and commune facilities (schools, health clinics, halls etc)
Control Measures	The IEO shall ensure that the Contractor prevent noise levels that are likely to an annoyance to the commune. All noise generating plant and equipment and processes shall be controlled to minimise noise. Control measure shall include: 1. Use of modern and well maintained equipment 2. Use of noise screens or mounds near residential areas 3. Advise commune leaders, school and health clinic staff etc when there will be unavoidable noise 4. Generally carry out all noisy construction activities during normal working hours. Contractor and IEO to negotiate with commune leaders, school and health clinic staff to identify any 'noise free' requirements and ensure that noisy activities are avoided at these times.
Monitoring	Weekly inspection of all noise producing sources on activities and subprojects. Discuss any problems with representatives of the commune.
Corrective Action	Any machines, plant or processes producing excessive noise shall cease operation and remedial action taken to the satisfaction of the IEO.

PEMM Environmental Management Guideline No. EMG 6

AIR QUALITY

Policy/Objective	1. To ensure there is no health risk, inconvenience or nuisance due to dust production; 2. Environmental health issues relating to inhalation of gases arising from cassava production
Control Measures	The Contractor shall control construction activities to prevent excessive dust generation and ensure that all facilities constructed for the purposes of processing cassava are adequately ventilated. Control measures shall include: **For Dust Suppression** 1. Spray water on exposed surfaces 2. Install wind breaks, dust screens or fences between exposed surfaces, concrete or tar batching areas and commune facilities and houses 3. Wet roads and tracks and fill being carried in open trucks 4. The principles of Integrated Pest Management should be adopted where possible to reduce the amounts of pesticides and fertilisers required to be applied. This will have a positive impact on water, soil and air quality (during spray application). **For Cassava Production** 1. Ensure that cassava is processed quickly after harvesting 2. Processing of the cassava must be conducted in a well ventilated area 3. Cassava must be dried, soaked in water, rinsed or baked to reduce linamarin content
Monitoring	**Dust Suppression** - Weekly inspection of all dust producing sources on activities and subprojects. Discuss any problems with representatives of the commune. **Cassava Production** – Ensure that any cassava processing facilities supported by the Program are well ventilated in any areas where processing takes place to safeguard human health
Corrective Action	Any problems or complaints to be acted upon immediately.

PEMM Environmental Management Guideline No. EMG 7

WATER QUALITY

Policy/Objective	To avoid contamination of potable water sources from solid waste, sewerage and construction activities. ***(Refer Table 25, Environmental Scoping Study for Vietnam Drinking Water Quality Guidelines)***
Control Measures	The Contractor shall ensure that all construction activities and disposal of waste products are managed to minimise their impact on local water sources. Control measures shall include: 1. Isolate construction plant, workshops, storage areas, concrete or tar batching areas etc from other surface runoff to prevent spillage entering local water sources. Clean and rehabilitate when activities are complete 2. Hazardous goods (including fuel and oil) shall be stored and handled only within an area set aside specifically for that purpose. This area shall be located away from drainage lines and bunded off from the remainder of the site. 3. Direct runoff from the site and wash up operations into a settling basin 4. Contain all stored waste within the construction site 5. During site clean up dispose of contaminants in an approved manner: burn all spilled fuel oil etc; discharge gaseous contaminants - diluting with fresh air; chemical an other liquid contaminants shall be stored in appropriate containers and disposed of at an authorised toxic landfill site 6. Crush, burn and bury all inorganic waste in an approved area 7. Compost or use as animal food all green organic wastes 8. New toilet facilities shall be: located away from sources of potable water supply; of sufficient capacity to service the population using the facility; and, above waterable pit latrines or composting toilets 9. All wells installed should be situated a recommended 20 metres away from any upslope source of contaminants such as a water buffalo wallow, animal pen, or unlined toilet 10. Ensure septic tank outflows are not located near potable water supplies or drain into the natural watercourse catchments 11. The principles of Integrated Pest Management should be adopted where possible to reduce the amounts of pesticides and fertilisers required. This will have a positive impact on water quality.
Monitoring	Daily visual assessment of control measures and water quality together with consultation with CPC leaders
Corrective Action	Any problems or complaints regarding water quality shall be addressed immediately by whatever measures are required to fix the problem.

PEMM Environmental Management Guideline No. EMG 8

SOIL & NUTRIENT MANAGEMENT

Policy/Objective	To control the severity and extent of erosion and prevent rivers and soil against deterioration via application of inappropriate amounts/rates of pesticides and fertilisers
Control Measures	The Contractor shall implement pre-construction, construction and post construction controls and management practices to minimise erosion. Control measures shall include: 1. Construct necessary temporary/permanent control structures such as catch drains, slope drains and bunds to divert stormwater around activities and construction sites. This may include **Site containment bunds:** low mounds, high enough to trap surface runoff, surrounding the construction or storage site, and drained through a single filtered outlet. **Site containment trench:** a dug trench which is sufficiently wide and deep to contain all surface runoff from the site, surrounding the construction or storage site, and drained through a single filtered outlet. **Silt trap, sediment basin or dam:** a pit dug along a drain or watercourse, or a dam placed across a drain or watercourse which will slow and retain the flowing water for a sufficient time to allow sediment to settle. Sand grains are deposited rapidly and silt traps in sandy areas may be small. Finer silt and clay particles are deposited very slowly. In clayey areas, and areas of high rainfall silt traps must be large enough to retain water for at least 24 hours. Silt traps must be cleaned out regularly. 2. Earthworks to be completed in stages such that a minimal area of ground is open or clear or exposed at any one time 3. Keep vegetation clearing to a minimum and avoid disturbance on steep slopes 4. Keep construction vehicles, plant and equipment on defined tracks 5.Ensure that borrow pits are located in areas not prone to erosion or that adequate erosion control measures are in place and encourage revegetation after construction activities have finished 6. Ensure that pesticides and fertilisers are applied in accordance with GOV guidelines and that the principles of Integrated Pest Management are adopted where possible to reduce the amount of pesticide and fertiliser inputs. This will have a positive impact on water and soil quality. ***(refer Tables 21 & 22 in Environmental Scoping Study and Section 2)***
Monitoring	The Contractor shall; regularly inspect the site to ensure that erosion control measures are in place and working effectively; and, inspect the site after heavy rains to check for damage such as scour, soil erosion or sediment deposition. The IEO shall inspect the site regularly during construction and activities to ensure compliance with the guidelines. The IEO and DDOs should ensure that pesticides and fertilisers are applied in accordance with GOV guidelines and that the principles of Integrated Pest Management are adopted to reduce pesticide and fertiliser inputs.
Corrective Action	Repairs to damaged areas, re-establishment of vegetation re-growth. Modify and improve drainage control strategies

PEMM Environmental Management Guideline No. EMG 9

CONTROLLING SEDIMENT

Policy/Objective	To minimise the impact of stormwater containing sediment on streams and coastlines
Control Measures	The Contractor shall implement pre-construction, construction and post construction controls and management practices to minimise sedimentation. Control measures shall include: 1. Construct necessary temporary/permanent control structures at the outset of construction. These structures may include the installation of filter-sediment fences, hay bales, filter drains, filter strips, grass outlets and sediment transport basin traps around culverts, drains, soil stockpiles and all other areas which may have the potential to erode or be affected by sedimentation 2. All disturbed areas that are not to be paved or gravelled should be revegetated or prepared for natural revegetation after final landscaping 3. Ground disturbance should be staged so that it is limited to areas of a workable size 4. Construction and activities should be scheduled so that large areas of soil and earth are not exposed during the wet season 5. Isolate construction plant, workshops, storage areas, concrete or tar batching areas etc from other surface runoff 6. Avoid discharging water onto unstable slopes or old landslips 7. Encourage revegetation after construction activities have finished
Monitoring	The Contractor shall; regularly inspect the site to ensure that sedimentation control measures are in place and working efficiently; and, inspect the site after heavy rains to check for damage such as scour, soil erosion or sediment deposition. The IEO shall inspect the site regularly during construction and activities to ensure compliance with the guidelines
Corrective Action	Repairs to damaged areas, re-establishment of vegetation re-growth. Modify and improve drainage control strategies

PEMM Environmental Management Guideline No. EMG 10

MANAGEMENT OF STOCKPILES & SPOIL HEAPS

Policy/Objective	To manage these features so that dust and sediment runoff are minimised
Control Measures	1. The Contractor shall negotiate with commune leaders about the location of dumping areas. If spoil is to be dumped in the local area, prepare a level site on which spoil can be dumped and piled 2. The stockpile or spoil heap location should be chosen so as to avoid blocking surface runoff or drainage lines. If this is not a ridge crest or flat plain site, the base should be be levelled and contained 3. If the stockpile or spoil heap contains fine sediments, it should not be left bare for long periods and should be covered to prevent dust generation, erosion and sediment runoff in areas of high rainfall 4. Stockpiles and spoil heaps must be subject to stability calculations to safeguard against a major slip occurring 5. Where possible, spoil should be used to backfill quarry areas or waste disposal sites or pits before they are re-vegetated 6. Isolate construction plant, workshops, storage areas, concrete or tar batching areas etc from other surface runoff 7. Avoid discharging water onto unstable slopes or old landslips 8. Encourage revegetation after construction activities have finished 9. Use erosion techniques set out in EMGs 8 and 9 to control sediment movement and erosion
Monitoring	The Contractor shall regularly inspect stockpiles and spoil heaps, in particular after heavy rains to check for damage such as scour, soil erosion or sediment deposition. The IEO shall inspect the site regularly during construction and activities to ensure compliance with the guidelines
Corrective Action	Repairs to damaged areas, re-establishment of vegetation re-growth.

PEMM Environmental Management Guideline No. EMG 11

WATER MANAGEMENT

Policy/Objective	To minimise the impact of contaminated runoff water and minimise the disruption to watercourses by infrastructure; and the selection of appropriate alignments for roads etc that avoid blocking lines of natural drainage where possible ***(Refer Table 25 Environmental Scoping Study)***
Control Measures	The Contractor shall implement pre-construction, construction and post construction controls and management practices to minimise sedimentation. Control measures shall include: 1. Runoff from non-construction areas should be diverted (temporarily) around the construction site to keep natural flow separate from construction runoff 2. The Contractor shall liaise with commune leaders to ensure that in areas of intensive gardening, shrimp farming or sensitive agriculture, especially in areas of high rainfall, runoff from construction sites will not be directed onto garden plots or fish ponds etc 3. Stormwater runoff from construction sites should pass through a gross pollutant trap (to filter plastics, cans etc) and over a vegetated surface to remove petroleum-based organic pollutants before discharging into drainage systems 4. Drains and culverts should be designed to remove all runoff water without scour. On steep slopes culverts may need to be stepped using rock slabs or gravel in gabion baskets 5. Select appropriate alignments for roads and other linear features that may disrupt drainage lines and ensure measures such as culverts allow for natural flow regimes to be maintained 6. Any new irrigation activity should take into account the volume of water available from groundwater resources to safeguard against lowering of water levels in wells and impacts upon the community 7. Ensure that pesticides and fertilisers are applied in accordance with GOV guidelines and that the principles of Integrated Pest Management are adopted where possible to reduce the amount of pesticide and fertiliser inputs.
Monitoring	The Contractor shall regularly inspect the site to ensure that stormwater control measures are in place and working effectively, in particular after heavy rains to check for damage such as scour, soil erosion or sediment deposition. The IEO shall inspect the site regularly during construction and activities to ensure compliance with the guidelines The IEO and DDOs should ensure that pesticides and fertilisers are applied in accordance with GOV guidelines and that the principles of Integrated Pest Management are adopted to reduce pesticide and fertiliser inputs.
Corrective Action	Repairs to damaged areas, re-establishment of vegetation re-growth.

PEMM Environmental Management Guideline No. EMG 12

VEGETATION CLEARANCE

Policy/Objective	To minimise the environmental impact of vegetation clearance on natural ecosystems, including flora and fauna
Control Measures	1. The Contractor shall liaise with DOSTE and commune leaders to identify vegetation areas that have significant value 2. Mature trees or trees of environmental significance must, where possible, be retained. Where trees in or near the construction site are to be retained they shall be protected throughout the construction period 3. Vegetation clearing shall be kept to a minimum 4. Encourage re-vegetation after construction activities have been completed
Monitoring	The Contractor shall regularly inspect vegetation areas to ensure that trees and vegetation of significance are not damaged ***(Refer Section 2.4 Environmental Scoping Study)*****.** The IEO shall inspect the site regularly during construction and activities to ensure compliance with the guidelines
Corrective Action	If significant vegetation or trees are cleared/damaged in the construction process, the need for rehabilitation works shall be discussed with DOSTE and commune leaders

PEMM Environmental Management Guideline No. EMG 13

ASSESSMENT & MANAGEMENT OF CONTAMINATION

Policy/Objective	To avoid where possible the selection of contaminated sites for redevelopment to inappropriate end uses (eg sites formerly used for pesticide, chemical or fuel storage to kindergartens)
Control Measures	1. The IEO/DDOs shall discuss with commune leaders the previous use of the site intended for redevelopment. 2. If the site was used for a known potentially contaminative end use such as fuel, chemical, pesticide or herbicide storage, and alternative site should be chosen for redevelopment 3. If the site is still preferred despite evidence of a previously contaminative use, soil samples should be taken from the site to characterise the nature and extent of any contamination present once it is known what the site was used for. This should be carried out following consultation with the Environmental Specialist 4. A sampling program will be supplied by the Environmental Specialist including how to take the samples, at what depth and what coverage is required to delineate the extent of the contamination. 5. The samples should be sent to an approved laboratory for analysis and a second laboratory to check results. The units in which measurements are to be made should be clearly stated by the IEO in accordance with instruction from the Environment Specialist. 6. The results should be reviewed by the IEO and Environmental Specialist against the requirements of appropriate soil, water and human health guidelines and a decision made as to whether to (a) continue development of the site, or select an alternative; or (b) what level of remediation (clean-up) is required. 7. The Environmental Specialist will submit a detailed report indicating what remediation or additional sampling needs to be carried out. 8. The IEO needs to select an appropriate contractor to remediate the site/remove contaminated material as required. The IEO or DDO should supervise this activity. All contaminated material should be disposed of in accordance with recommendations in the Environmental Specialists report. As a minimum contaminated soil should be sent to a clay lined landfill where it cannot escape to reach the broader environment 9. Additional samples shall be taken to ensure that contamination has been removed sufficient for the safe use of the site for its new end use.
Monitoring	1. **Short term** The IEO should supervise that contamination clean-up occurs in accordance with the guidelines set out in the 'remediation plan for the site. 2. **Long Term** If a formerly contaminated site has undergone redevelopment to a new use, the IEO shall undertake the required ongoing monitoring to ensure that contamination clean up has removed contaminants to safe levels commensurate with the new use of the site. This might for example include taking additional soil samples from the site or water samples from nearby wells.
Corrective Action	If contractors do not remediate (clean-up) contaminated material in accordance with instructions, the IEO should recommend use of an alternative contractor for future work.

7 Environmental Management Plans

7.1 Introduction

An EMP is a project-specific activity plan designed to minimise the negative impacts identified in the EIA process. It is not a formal legal document. An EMP can cover a whole program, or it may be a very simple plan to control specific subprojects or activities.

For most subprojects and activities under RUDEP the impacts are anticipated as being small-scale, restricted in extent, or limited in number, a formal environmental plan will not be necessary, but an EMP still needs to be produced.

The EMP might include site-specific recommendations to mitigate the projected negative impacts of sub-projects and activities. Normally this will involve taking the relevant recommendations made in the EIAC and EMGs and applying these to the management of any environmental issues associated with the sub-project or activity. These recommendations will be incorporated into any contract documents. Monitoring and evaluation will involve checking the progress and effectiveness of the recommendations in achieving the requirements of the EMP.

In the context of the Program the EMP will likely consist of an EMP summary sheet, and relevant EMGs identified by the EIAC.

7.2 Preparation of the EMP

Completion of the EIA Checklist will identify the site-specific environmental issues that need to be addressed. The checklist contains references to relevant EMGs (Section 6) that provide steps to avoid or minimise any negative impacts. The IEO will compile the selected guidelines and complete an EMP summary sheet. This summary sheet, with the selected guidelines attached, will form the project EMP.

The PMU will incorporate, where appropriate, the recommended control measures into RUDEP documentation, for example, locate site containment bunds, preferred stockpile area, filter fencing, etc. on any site plans and maps. The EMP will be attached to project documentation submitted to DOSTE for approval.

7.3 Monitoring Requirements

The EMP should state the level of monitoring to be carried out, the responsibility for monitoring, and the remedial activities, which will be carried out if there are any failures of, or non adherence to, the EMP.

Monitoring *(as described in Section 4.5 of the EI&MI Scoping Study)* should be carried out as part of the regular on-site supervision activities associated with project implementation. The frequency of the monitoring of particular elements will be dependent on the level of environmental risk or potential impact associated with a particular RUDEP component.

Construction contractors will be required to monitor all environmental measures incorporated within the project scope of works. The IEO will be responsible for monitoring compliance with, and the effectiveness of, the EMP. DOSTE and PMU will check and assist IEO carry out the monitoring responsibilities and report any serious deficiencies. At subsequent site meetings the PMU will check and assist the IEO carry out their monitoring responsibility and to report any serious deficiencies to DPI and AusAID.

Annex 1

Environmental Action Plan (EAP)

Annex 1: Environmental Action Plan (EAP)

The EAP is a listing of all Program environmental issues as identified during the Preliminary and Second Environmental Audit visits by the Environmental Specialist. The EAP table provides a means of listing all issues of environmental significance associated with Program supported activities and is set out by commune. It is also designed to provide the DDO with a current listing of the status of all environmental issues for his/her commune for monitoring/planning purposes.

It is the responsibility of the IEO to keep the EAP up to date and report periodically on the status of issues to the PMU, ATL, VTL and Environmental Specialist. The EAP table template is set out below, with some example entries for the IEO to follow. The IEO should take the recommendations from the Second Audit report and list these in the EAP table below, maintaining it as a record of the status of management of issues on a commune by commune basis, regularly updating it as required.

Table 1: Environmental Action Plan

Commune	Activity	Action Required	By whom	Date	Status
Duc Phong	Ongoing monitoring of remediated kindergarten site	Take further grab sample from the nearby bore and analyse in 12 months time to ensure that any residual material is not seeping into the bore	IEO/DDO	Dec 2004	Being managed
Son Hai	The road was badly damaged due to recent heavy rain resulting in erosion and gulleying.	Repair required by contractor, supervised by IEO. Where steeper or longer sloped sections are unavoidable, cross drains and catch banks should be put in place to reduce the flow of water down the track. The sides of the road should furthermore be stabilised using either mechanical means such as wooden stakes and a mulch cover, or via the establishment of vegetation cover to prevent erosion	Contractor with supervision by IEO	Eg. March 2004	Eg. Currently selecting best contractor. Decision to be made by end Feb 2004